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Design and straightforward synthesis of novel galloyl phytosterols with excellent antioxidant activity

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ACCEPTED MANUSCRIPT

1	Design and Straightforward Synthesis of Novel Galloyl Phytosterols with
2	Excellent Antioxidant Activity
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9	
10	Abstract: Novel galloyl phytosterols were rationally designed by incorporation of
11	gallic acid into phytosterols through straightforward esterification. The esterification
12	was successfully achieved by coupling of gallic acid and phytosterols through a mild
13	chemical Steglich esterification reaction that is more straightforward than the
14	enzymatic method. The identity of the newly synthesized galloyl phytosterols was
15	confirmed by NMR, HPLC-MS and IR spectroscopies. Further evaluation of the novel
16	galloyl phytosterols with radical scavenging, ferrous ion chelating, and Rancimat
17	methods revealed its excellent antioxidant activities that are comparable to the most
18	potent fat-soluble antioxidants. This novel antioxidant offers an intriguing solution for
19	naturally derived antioxidants and will have great potential application as antioxidant
20	in food industry. The methods developed in this study will be valuable for
21	development of other phenolic phytosterols.
22	Keywords: phytosterol: gallic acid: phenolic phytosterol: galloyl phytosterol:

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